

CLAIMS

What is claimed is:

1. (Currently Amended) A gas concentration measurement instrument for measuring change in concentration of gas in a measurement region, comprising:

ultrasonic wave transmitting means for transmitting an ultrasonic wave composed of a group of rectangular pulse waves as an ultrasonic wave generation signal;

ultrasonic wave receiving means for receiving an ultrasonic wave transmitted through the gas in the measurement region and converting the ultrasonic wave transmitted through the gas in the measurement region into an electric signal to use it as an ultrasonic wave reception signal; and

gas concentration measuring means for measuring a signal output time when the ultrasonic wave generation signal is outputted, generating an envelope processing signal by subjecting the ultrasonic wave reception signal to an envelope extracting process, measuring a threshold fall time when the envelope processing signal decreases below a predetermined threshold after exceeding the threshold, and measuring the difference between the threshold fall time and the signal output time as an indication of change in the gas concentration.

2. (Original) The gas concentration measurement instrument according to claim 1, wherein the difference between the threshold fall time and the signal output time linearly responds to the gas mixture ratio.

3. (Currently Amended) A gas concentration measurement method for measuring change in concentration of gas in a measurement region, comprising:

transmitting an ultrasonic wave composed of a group of rectangular pulse waves through a gas in a measurement region as an ultrasonic wave generation signal;

receiving the ultrasonic wave transmitted through the gas in the measurement region;

converting the ultrasonic wave transmitted through the gas in the measurement region into an electric signal to use it as an ultrasonic wave reception signal; and

measuring a signal output time when the ultrasonic wave generation signal is outputted, generating an envelope processing signal by subjecting the ultrasonic wave reception signal to an envelope extracting process, measuring a threshold fall time when the envelope processing signal decreases below a predetermined threshold after exceeding the threshold, and measuring the difference between the threshold fall time and the signal output time as an indication of change in the gas concentration.